Water Quality (WQ) WORKING GROUP
MIT SeaGrant

Cambridge, MA
10:00am to 4:00pm
15 March 2004

MEETING SUMMARY

ACTION: **Writing Assignments Due By April 1, 2004**
Work group (WG) members with writing assignments will need to send their finished assignment to Sanctuary staff no later than April 1, 2004. Draft Finals of the documents will be to WG members for final review by April 15, 2004. Comments must be returned to Sanctuary staff before the next meeting.

ACTION: **Writing Assignments for Draft Action Plan**
During the meeting, templates for the WQ WG Action Plans were developed. Five draft Action Plans including: Water Quality, Discharge, Contaminants, Emergency Response, and Discharge and Other Sources were developed (drafts of each Action Plan can be found in Appendices A through E at the end of this summary). WG members have been assigned portions of the Action Plans to develop and/or revise. The assignments were as follows:

WG Member	Action Plan	Section
Mike Mickelson	Water Quality	Strategy 1 Strategy 1, Activity 3 Strategy 2
Anne Smrcina:	Water Quality	Strategy 1 Strategy 2 Strategy 2, Activity 5 Strategy 3, Activity 4
	Discharge	Strategy 1, Activity 7
	Contaminants	Goals Strategy 1, Activity 5
	Emergency Response	All
	Discharge and Other Sources	All
Douglas Ofiara	Water Quality	Strategy 1, Activity 6
	Discharge	Strategy 1, Activity 8
	Contaminants	Strategy 1, Activity 4
	Discharge and Other Sources	All
Ann Rodney	Water Quality	Strategy 1, Activity 6
	Discharge	Background Strategy 1, Activity 6
	Discharge and Other Sources	All
Jamie Collier	Water Quality	Strategy 3, Activity 2
Jack Wiggin	Discharge	Background

WG Member	Action Plan	Section
Brad Wellock	Discharge	Strategy 1, Activity 4 Strategy 1, Activity 5 Strategy 1, Activity 6 Strategy 2
Chantal Lefebvre	Discharge	Strategy 1, Activity 8
Judy Pederson	Discharge	Strategy 2
Ken Keay	Contaminants	Background
Jan Smith	Contaminants	Strategy 1, Activity 1 Strategy 1, Activity 2 Strategy 1, Activity 3
Ben Cowie-Haskell	Emergency Response	All
Gabrielle McGrath	Emergency Response	All

ACTION: **Next Meeting**
Then next Water Quality Working Group meeting is set for April ??, 2004.

Working Group Attendees (March 15, 2004):

Name	**WG Seat / Affiliation**	**Attendance**
Judy Pederson	WG Chair	Present
Anne Smrcina	Team Lead (SBNMS)	Present
Jack Wiggin	Urban Harbors Institute	Present
Douglas Ofiara	Muskie School of Public Service U. of S.ME	Present
Carlton Hunt	Battelle Ocean Services	Present
Frederick Dauphinee	MA Lobsterman's Association	Not-Present
Jamie Collier	Center for Coastal Studies	Present
Tara Nye	Association for the Preservation of Cape Cod	Not-Present
Michael Mickelson	MA Water Resources Authority	Present
Ann Rodney	US EPA	Present
Jan Smith	MA Coastal Zone Management	Not-Present
Mike Leone	MassPort	Not-Present
Brad Wellock	MassPort	Present
Marcia Duffy	MassPort	Not-Present
Tom King	Charter Boat Captain	Present
Lt. Gabrielle McGrath	US Coast Guard	Not-Present
Technical Advisors		
Meng Zhou	UMass, Boston	Not-Present
Pierre Lermusiaux	Harvard University	Not-Present
Others Present		
Regan Maund	Urban Harbors Institute	Present
Rachel Harold	Oceana	Present
Chantal Lefebvre	Urban Harbors Institute	Present

WELCOME, INTRODUCTIONS AND ADOPTION OF AGENDA

Judy Pederson, the WG Chair, opened the meeting and welcomed all members. After the opening comments, each attendee briefly introduced themselves. The meeting agenda was presented and set for the day.

OLD BUSINESS AND ACTION ITEMS

Anne Smrcina and Judy Pederson review the action items and assignments identified during the last meeting. WG members were asked to provide input as necessary.

Ship Statistics 1

Brad Wellock, from MassPort, provided a comprehensive list of vessels using Boston Harbor and provided the following information on vessel operations in the area.

Vessels Offloading in Boston Harbor

The total number of offloading vessels, with drafts of 35 feet or more, in Boston Harbor in 2003 was 396. Boston Harbor Pilots estimate at total of 2000 trips (either in or out, not both), but many of these trips included vessels with drafts less then 35 feet. Of the 396 vessels with drafts more than 35 feet, the totals by type are listed below:

- Container: 59
- Tanker: 161
- LNG: 54
- Salt: 22
- Scrap: 5
- Cruise: 95

Those vessels not accounted for include approximately 24 small container ships to Cold Water Storage dock, 12 cement ships to Coastal Cement, 28 cement ships to Blue Circle Cement, 12 automobile ships to Autoport, 24 small ships to East Boston SY, 36 tug barges from Canada, 7 scrap ships, 52 container ships from Canada to Conley, 50 container barges from NY and NJ that use the Cape Cod Canal, and 120 oil barges from NY that also use the Cape Cod Canal.

It is important to note that the Department of Transportation projects commercial road traffic to double between NY and Boston. Because of this, coastal shipping is being considered more closely. Shipping traffic could increase to alleviate commercial road traffic.

Questions & Answers

Question 1: What is the number of vessel owners?

Answer: The total number of vessel owners is approximately 122.

Ship Statistics 2

Jack Wiggin, from UMass Boston, compiled data on vessel traffic that crossed the Sanctuary from sources on the internet and presented the WG with a list of whale watch vessels along with the following information.

Vessel Traffic

The information compiled about vessel traffic included commercial fishing vessels, commercial whale watch vessels, small "Mosquito" whale watch vessels, charter or private fishing vessels, commercial shipping and cruise ships. In 1986, commercial whale watch vessels crossed Stellwagen Bank 6000 times. Commercial shipping crossed the Bank 2700 times from 1989 to 1990. In 2002, charter or private boats crossed the Bank 200,000 times.

Total number of vessels by year and type are as follows:

Year	Type	Number
1986	Commercial Whale Watch	40
1989-1990	Commercial Shipping	280
1990	Commercial Fishing	280
	Charter/Private	250
1994	Small Whale Watch	40
2001	Cruise Ships	219
2002	Commercial Fishing	200-250
	Commercial Whale Watch	30-40

	Cruise Ships	30
2003	Cruise Ships	90 (scheduled)
2004	Cruise Ships	94 (scheduled)

This data, however, fails to capture the cruise ships that did not enter the Port of Boston, but traversed the Bank. Further, these numbers probably do not include traffic exiting the Cape Cod Canal and continuing northward or ferry traffic, sailing vessels, research vessels, tug boats and military vessels. More information is needed on the capacity and practices of both cruise and transport vessels.

Whale Watching
Whale watching effort shows some increase from 1994 to 2002. In 2002, ninety percent of whale watching effort in New England was reported to be concentrated within the boundaries of the Sanctuary. In 1994, Eighty percent of whale watching effort was concentrated on Stellwagen Bank.

Impact of Pumpout Facilities
Pumpout facilities exist in Plymouth MA, but whale watch vessels that do not have access to pumpout facilities are unlikely to release sewage into Cape Cod Bay. These vessels will usually go to an area of deep water east of Stellwagen Bank called "the triangle" to pump out. This area is away from customary whale watching areas.

Ballast Water Management (BWM)
Handouts were presented to the WG that covered BWM. It was explained to the WG that industry supports an internationally accepted mandatory BWM program. It is understood by industry that there is a need for consistency between international and national programs. Solutions must be beneficial, achievable, cost-effective and not disrupt maritime trade both within the U.S. and between the U.S. and its international trading partners.

U.S. Coast Guard (USCG) Requirements
Current Coast Guard efforts include:

- Implementation of penalties for failing to report
- Mandated BWM practices for all vessels equipped with ballast water tanks operating in U.S. waters
- Shipboard Technology Evaluation Program (STEP) to encourage installation of experimental ballast water treatment technologies
- Established ballast water discharge guidelines

Vessels exempt from proposed reporting and recordkeeping requirements are:

- Vessels operating exclusively within one COTP zone
- Crude oil tankers in coastwise trade
- Department of Defense, USCG or any vessel of the Armed Services

Although these rules are currently in place, they will be rewritten to be in accordance with the International Maritime Organization (IMO) Treaty.

International Convention for the Control and Management of Ships' Ballast Water and Sediments

International Convention for the Control and Management of Ships' Ballast Water and Sediments includes the following:

- Applies to all ships with certain exceptions
- Allows countries individually or jointly to take "more stringent measures" with such measures NOT subject to IMO approval
- All ships must carry an approved ballast water management plan and maintain a ballast water record book
- Two standards established
    - Standard D-1: Ballast water exchange with 95% volumetric efficiency, occurring whenever possible 200 nautical miles off shore and in at least 200 meters of water. Where impossible due to route, exchange must take place at least 50 miles off shore in at least 200 meters of water. Port state may designate "exchange zones" with lesser distance and depth.
    - Standard D-2: Less than 10 viable organisms per cubic meter for organisms that are greater than or equal to 50 microns AND less than 10 viable organisms per milliliter for organisms that are less than 50 microns but greater than or equal to 10 microns AND three indicator micron discharge limits. Ballast water management systems using "active substances" must be approved by IMO.

No Discharge Areas
At a previous meeting WG members were interested in determining whether or not SBNMS could become a No Discharge Area (or Zone) under CWA 312 40 CFR 140. Ann Rodney of the U.S. EPA was asked to investigate this issue. She determined that CWA 312 40 CFR 140 only applies to state waters not federal waters. In the Florida Keys Sanctuary only the state waters are a No Discharge Area. None of the federal waters are No Discharge Areas.

PRESENTATION

Proposed Federal Legislation Pertaining to Cruise Discharges
Rachel Harold from Oceana presented information on the Clean Cruise Ship Act of 2003, to be introduced by Senator Richard J. Durbin.

Clean Cruise Ship Act of 2003
Cruise ships are currently exempt from critical regulations that would help protect the oceans and marine wildlife, except in Alaskan waters which are protected by federal legislation enacted last year. Enacting the Durbin Bill can extend these protections. The Durbin Bill draws from key provisions of the Alaskan legislation and the Clean Water Act. If the Bill were to pass it would:

- Prohibit untreated discharges of sewage (including sewage sludge), graywater and bilge water within 12 miles of the U.S. shore.
- Establish minimum limits for levels of fecal coliform and chlorine in treated sewage and graywater, and require the Coast Guard and EPA to issue final standards by 2015.
- Provide for inspection of discharge operation and equipment, including sampling and testing.
- Require the Coast Guard to establish a three-year program in which independent observers would be placed onboard cruise vessels to monitor compliance of cruise vessels with all applicable laws.

- Direct NOAA to help develop and foster commercialization of alternative technologies that would allow for monitoring of cruise ship compliance with all applicable laws.
- Implement whistleblower protection for employees who report employers' in noncompliance with the Act.
- Empower citizens to commence a civil action against anyone in violation of the Act.
- Authorize appropriations and establish a Cruise Ship Vessel Pollution Control Fund, which would be funded through fees on cruise vessel voyages.

Questions & Answers

Question 1: Would this act affect fishing vessels?

Answer: No.

Question 2: How does this legislation tie into the Clean Water Act?

Answer: This legislation draws some key provisions from the Clean Water Act, but it is a separate legislation.

Question 3: Do vessels currently have the option to offload in port?

Answer: The option to offload in port does exist; however offloading would require specialized training of crews and modification of equipment. This in conjunction to the extra time needed, would require extra money. Vessels, in general, wait to get outside the three-mile limit.

ACTION PLAN DEVELOPMENT

Judy Pederson began by explaining the format for constructing a draft Action Plan (see Appendices A-E). Using the Cruise Ship Discharges Action Plan from the Monterey Bay National Marine Sanctuary as a guide, the WG decided to use the following major headings:

- **Goal Statement:** An opening description of the goal
- **Background:** Information to help understand the issue
- **Strategy:** Itemized strategies, complete with activities, to meet the stated goal

Topic Identification

Action Plan drafts would be created for issues that were previously identified during public scoping meetings. The WG selected the following items as the most important issues to be addressed:

- **Water Quality**
- **Discharge**
- **Contaminants**
- **Emergency Response**
- **Discharges and Other Sources**

Issue 1: Contaminants or Sediments

Originally, the WG identified "Sediments" as an item to be included in the action plan. However, "Sediments" was changed to "Contaminants".

Discussion: The issue of sediments was originally brought forward during public scoping. WG members discussed the impact of sediments on the water column and decided that contaminants

contained within the sediments were of greater concern. It was decided that using the heading "Contaminants" would be more appropriate.

WG Strategy for Action Plan Development
Judy Peterson listed the major headings for each of the template items (see above) and asked WG members to provide the information to be used in each of the proposed Plans. It was decided that key points would be added to each Plan as placeholders. WG members would then be assigned sections for further development (refer to the second ***ACTION*** item at the beginning of this summary for a list of assignments). Each assignment must be completed by April 1, 2004.

Water Quality Action Plan
The overall goal for the Water Quality Action Plan was previously determined to be "develop a water quality program in SBNMS to assess the health of the Sanctuary as it meets the goals of protecting natural and cultural resources." To meet this goal, the WG devised a series of strategies and activities to be included in the draft Action Plan. The draft Water Quality Action Plan, as constructed by the WG, can be found in Appendix A.

Issues raised during the drafting session are noted below.

Issue 1: Water Quality Monitoring Plan
To meet the stated goal, a water quality monitoring plan would need to be developed.

> ***Discussion:*** The Chair felt it was important for the WG to understand that a "plan" was a written statement and that a "program" was the actual implementation for a stated plan. Therefore, in order to meet the goal of developing a water quality program for assessment, the plan needed to be clearly stated. The plan should address comprehensive baseline monitoring. The WG agreed to include the development of a water quality monitoring plan as a strategy. This strategy will include the following activities:
>
> - Summarize what is being done within the SBNMS
> - Annual meeting to review the monitoring program by agencies, scientific advisors and stakeholders.
> - Determine the appropriate measures and indicators (e.g. primary productivity, nutrients, pathogens, plankton, etc.)
> - Oversight committee
> - Outreach and education
> - Regulations
>
> ***Comment:*** Members of the WG identified that a process should be in place that allows for modification of current monitoring programs. It is important to be able to increase monitoring if needed. Data from such programs would also need to be displayed to the public, as an outreach program, in a timely manner.

Issue 2: Encourage Placement of Oceanographic Monitoring Stations
Oceanographic monitoring stations are already in existence for various programs (i.e., GOMOOS). Monitoring stations located within the SBNMS would help meet the stated goal.

Discussion: Members of the WG felt that the Sanctuary should have some input on the placement of new oceanographic monitoring stations. Agencies and organizations with existing monitoring programs should be encouraged to place potential new monitoring stations within the Sanctuary. Cooperation and communication between groups, agencies and the Sanctuary would help facilitate monitoring station placement. Compiling a list of existing programs would be beneficial. This strategy included the following activities:

- Incorporate data from existing ocean observing systems within the monitoring program
- Incorporate available satellite imagery
- An advisory panel should review the use of data from GOMOOS and possible additions to the monitoring program
- Investigate emerging technology for remote sensing surface currents
- Outreach and education

Comment: WG members felt that both current and emerging technologies should be used to monitor oceanographic processes. CODAR, CTD, STD, and Acoustic Doppler are currently in use and should be continued.

Issue 3: Evaluate Use and Utility of All Models for Sanctuary Management
Models currently exist that may have applications for Sanctuary management (i.e., HAB, BEM, Gulf of Maine, etc.). Knowing all models and evaluating their use and utility for the Sanctuary would help meet the goal of developing a water quality program.

Discussion: The WG acknowledged the importance of utilizing all currently available data and models. Evaluating the use and utility of all available models was added as a strategy. This strategy will require the following activities:

- Compile a list of all models and determine direction of these models as applied to Sanctuary goals
- Discussion around food-web models
- Determine the need for model evaluation group
- Outreach and education

Comment: NRDA models would be useful for the SBNMS.

Discharge Action Plan
The overall goal for the Discharge Action Plan was determined to be "to prevent impacts to Sanctuary resources from discharges from cruise ships and other vessels." To meet the goal, the WG devised a series of strategies and activities to be included in the draft Action Plan. The template for the Discharge Action Plan, as constructed by the WG, can be found in Appendix B.

Issues raised during the drafting session are noted below.

Issue 1: Investigate Options to Declare the Sanctuary a No Discharge Zone
Although it currently appears that the Sanctuary cannot be declared a No Discharge Zone, to meet the stated Action Plan goal WG members felt strongly that this should still be added as "Strategy 1" in the draft Discharge Action Plan.

Discussion: It was noted that the Action Plans would be given to the SAC as a series of recommendations. WG members felt it important to provide the SAC with a No Discharge Zone recommendation. Therefore, investigating options to declare the Sanctuary a No Discharge Zone was added as a strategy that should include the following activities:

- Define the magnitude of vessel discharges within the Sanctuary
- Compare vessel discharges with non-vessel discharges to understand the magnitude
- Create an advisory group of vessel owners and others to define a practical program for discharge
- Project the impact of coastal shipping
- List transportation models
- Describe vessel traffic through Cape Cod Canal that has destinations north of Boston Harbor
- Outreach and education
- Regulations

Issue 2: Ballast Water

A method for managing ballast water dumping was considered an important strategy for meeting the stated goal for the draft Discharge Action Plan.

Discussion: The WG discussed the issue of ballast water management in the Sanctuary. As noted above in the **Ballast Water Management** handouts discussion, guidelines are being created and altered to become more consistent. The shipping industry supports more consistent ballast water guidelines, providing they are beneficial, achievable, cost-effective and will not disrupt maritime trade both within the U.S. and between the U.S. and its international trading partners. Ballast water was added as a strategy and assigned to a WG member for further development (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments).

Contaminants Action Plan

The overall goal for the for the Contaminants Action Plan was tentatively set as "determine if sediments act as sources of contaminants in the water column as they affect the resources of the Sanctuary." It was agreed by the WG to use this goal as a placeholder and that a WG member would provide a revised goal statement by April 1, 2004 (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments). To meet the goal, the WG devised a series of strategies and activities. The template for the Contaminants Action Plan, as constructed by the WG, can be found in Appendix C.

Issues raised during the drafting session are noted below.

Issue 1: Evaluate and Characterize Sources to the Sanctuary

To determine if sediments act as a source of contamination in the Sanctuary, potential sediment sources to the Sanctuary will need to be evaluated and characterized.

Discussion: It was determined by the WG that contaminants could potentially be released from sediments. It was important consider atmospheric deposition, urban run-off, PCB's and endocrine disruptors as sources for contamination of the water column. The WG agreed to add

the evaluation and characterization of sources to the Sanctuary as a strategy with the following activities:

- Atmospheric Deposition and Urban Run-Off
- Persistent Organic Pollutants
- All Others
- Outreach and Education
- Regulations

Emergency Response Action Plan
The overall goal for the Emergency Response Action Plan was tentatively set as "coordinate with other agencies to be adequately prepared for an oil spill or other emergency". It was agreed by the WG to use this goal as a placeholder and that a WG member would provide a revised goal statement by April 1, 2004 (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments). To meet the goal, the WG set three strategies:

- Characterize vessel traffic across the Sanctuary
- Characterize emergency response plan
- Regulations (NRDA)

These strategies and all other items associated with the Emergency Response Action Plan were assigned to a WG member for development (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments). The draft of the Emergency Response Action Plan, as constructed by the WG, can be found in Appendix D.

Discharges and Other Sources Action Plan
The overall goal for the Discharges and Other Sources Action Plan was tentatively set as "reduce impacts form other disposal activities within and outside the Sanctuary to meet the resource protection goals of the Sanctuary." It was agreed by the WG to use this goal as a placeholder and that a WG member would provide a revised goal statement by April 1, 2004 (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments). To meet the goal, the WG devised a series strategies and activities. The template for the Discharges and Other Sources Action Plan, as constructed by the WG, can be found in Appendix E.

Issue 1: Characterize and understand sources and potential impacts
Sources and potential impacts of discharge activities need to be characterized and understood to meet the stated goal.

Discussion: The WG recognized potential sources such as the MWRA outfall and Mass. Bay Disposal Site. Monitoring these and other potential sources needs to be conducted. Preparations should also be made to be proactive to any catastrophic failure. The WG added this issue as a strategy along with the following activities:

- MWRA outfall discharge
- Mass. Bay Disposal Site
- Develop response plan for catastrophic failure or events
- Monitoring plan in response to event

- Potential sources
- Outreach and education

A WG member has been assigned to further develop the content of this Acton Plan by April 1, 2004 (refer to the table presented under the second ***ACTION*** item at the beginning of this summary for a list of assignments).

FINAL COMMENTS

Review of Items for Next Meeting
The Chair reviewed the documents and assignments. All writing assignments are to be turned in to Sanctuary staff by April 1, 2004. The documents will be compiled and sent out to the WG for comment by April 15, 2004. All comments must be returned to Sanctuary staff before the next meeting.

Next Meeting
A call for dates for the next meeting was made. The next Water Quality WG meeting is to be set on April 22, 2004 – April 30, 2004.

Meeting adjourned at 3:30 pm.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Sanctuary System
Stellwagen Bank National Marine Sanctuary
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Scituate, MA 02055
(781) 545-8026 FAX: (781) 545-8036

AGENDA
15 March 2004
10:00 A.M. to 4:00 P.M.
MIT Sea Grant, Cambridge, MA

10:00 – 10:15	Introductions, Adoption of Agenda, 1/9/04 minutes, Alternates Judith Pederson, MIT Sea Grant, WQ WG Chair Anne Smrcina, SBNMS, WQ WG Team Lead
10:15 – 10:45	Working Group Discussion Development of Goal Statement for sanctuary water quality action plan
10:45 - 11:15	Review of material from assigned tasks Ship Statistics -- Brad Wellock, MassPort Ship Statistics -- Jack Wiggin, Urban Harbors Institute No Discharge Areas background -- Ann Rodney, EPA
11:30 – 12:30	Proposed Federal Legislation Pertaining to Cruise Discharges -- Presentations: Rachel Harold, Oceana
12:30 – 1:15	*Working Lunch* *Discussion: Can the Stellwagen Bank Sanctuary use Action Plans from other sanctuaries as models in this process? Which plans have strategies that might be adapted for these purposes?*
1:15 -- 3:45	Discussion of Issues Relative to SBNMS "Water and Sediment Quality" and development of strategies for priority Action Plans
3:45 – 4:00	W.G. Logistics (Meeting Dates), Next Steps and Summary
4:00	Adjourn

APPENDIX A

Goal:
Develop a water quality program in SBNMS to assess the health of the Sanctuary as it meets the goals of protecting natural and cultural resources.

Background:

WATER QUALITY

Strategy 1: Develop water quality monitoring plan

Activity 1: Summarize what is Being Done Within SBNMS

Activity 2: Annual Meeting to Review Monitoring Program by Agencies, Scientific Advisors and Stakeholders

- ***Address the Issue of Comprehensive Baseline Monitoring.***
- ***Focus on Key Water Quality Questions in Relation to the Sanctuary***

Activity 3: Determine Appropriate Measures and Indicators (e.g. primary productivity, nutrients, pathogens, plankton, etc.)

Activity 4: Oversight Committee

Activity 5: Outreach & Education Conducted through Annual Reports, Database, and Web-based Materials

- ***Make Data Available Quickly***
- ***Educate the Public on Water Quality Issues in General***

Activity 6: Regulations

Strategy 2: Encourage placement of oceanographic monitoring stations in SBNMS and integrate monitoring station into site characterization research planning

Activity 1: Incorporate Data From Existing Ocean Observing Systems Within the Monitoring Program

Activity 2: Incorporate available satellite imagery

Activity 3: Advisory Panel Should Review the Use of Data from GOMOOS and Possible Additions to the Monitoring Program

Activity 4: Look at Emerging Technology for Remote Sensing Surface Currents

Activity 5: Outreach and Education

- ***Partner and Compliment GOMOOS Outreach and Education***

Strategy 3: Evaluate the use and utility of models for sanctuary management

Activity 1: Compile a List of All Models (HAB, BEM, Gulf of Maine etc.) and Determine Direction of These Models as Applied to Sanctuary Goals

Activity 2: Discussion Around Food-Web Model (Example: sandlance or whales)

Activity 3: Determine the Need for Model Evaluation Group

Activity 4: Outreach and Education

- ***Partner and Compliment GOMOOS Outreach and Education***

APPENDIX B

Goal:

To prevent impacts to sanctuary resources from discharges from cruise ships and other vessels

Background:

DISCHARGE

Strategy 1: Investigate Options to Declare the Sanctuary a No Discharge Zone

Activity 1: Define the Magnitude of Vessel discharges within the Sanctuary

Activity 2: Compare Vessel Discharges with Non-Vessel Discharges to Understand the Magnitude

Activity 3: Create Advisory Group of Vessel Owners and Others to Define a Practical Program for Discharge

Activity 4: Project the Impact of Coastal Shipping

Activity 5: List Transportation Models

Activity 6: Describe Vessel Traffic Through the Cape Cod Canal That Have Destinations North of Boston Harbor

Activity 7: Outreach & Education.

Activity 8: Regulations

Strategy 2: Ballast water

APPENDIX C

Goal Statement:

Determine if sediments act as sources of contaminants in the water column as they affect the resources of the Sanctuary.

Background:

CONTAMINANTS

Strategy 1: Evaluate and characterize sources to the Sanctuary

Activity 1: Atmospheric Deposition and Urban Run-Off

Activity 2: Persistent Organic Pollutants (example: PCBs)

Activity 3: All Others (Examples: Mass Bay Disposal Site, Gulf of Maine)

Activity 5: Outreach & Education

Activity 4: Regulations

APPENDIX D

Goals:

Coordinate with other agencies to be adequately prepared for an oil spill or other emergency

Background:

EMERGENCY RESPONSE

Strategy 1: Characterize vessel traffic across the Sanctuary

Strategy 2: Characterize emergency response plan

Strategy 3: Regulations (NRDA)

APPENDIX E

Goals:

Reduce impacts from other disposal activities within and outside the Sanctuary to meet the resource protection goals of the Sanctuary

Background:

DISCHARGES AND OTHER SOURCES

Strategy 1: Characterize and understand sources and potential impacts

Activity 1: MWRA Outfall Discharge

Activity 2: Mass Bay Disposal Site

Activity 3: Develop Response Plan for Catastrophic Failure or Events

- ***Use Current and Future Models (FEMA, HAZUS)***

Activity 4: Monitoring Plan in Response to Event

Activity 5: Potential sources (Examples: mariculture, chlorine)

Activity 6: Outreach and Education

- ***Public Document on Relative Strengths***